NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

PEST MANAGEMENT

(Acre)

CODE 595

DEFINITION

Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species) that directly or indirectly cause damage or annoyance.

PURPOSES

This practice is applied to support the following purposes:

- Enhance quantity and quality of crops grown for food and fiber.
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pests will be managed.

CRITERIA

General Criteria Applicable to All Purposes

A pest management component of a Resource Management System (RMS) conservation plan shall be developed whenever pests are managed.

All methods of pest management must comply with Federal, State and local regulations including management plans for invasive pest species, noxious weeds and disease vectors. Compliance with the Food Quality Protection Act (FQPA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Worker Protection Standard (WPS) and the Endangered Species Act (ESA) is required for chemical pest control.

The pest management component of an RMS plan shall be developed in accordance with requirements outlined in the NRCS General Manual Title 190, Part 404 and Title 180, Part 409.11; technical requirements of the Idaho NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH) and the NRCS National Agronomy Manual (NAM), Section 503.

Persons who approve plans for pest management shall be certified through the Idaho NRCS certification program or other acceptable program, as designated by the State Conservationist.

Integrated Pest Management (IPM) that strives to balance economics, efficacy and environmental risk shall be incorporated into planning alternatives. IPM is a sustainable approach to pest control that combines the use of prevention, avoidance, monitoring and suppression strategies to:

- Maintain populations below economically damaging levels.
- Minimize pest resistance.
- Minimize harmful effects of pest control on human health and environmental resources.

IPM suppression systems include biological controls, cultural controls and the judicious use of chemical controls. Crop specific IPM recommendations for planning alternatives are available from the University of Idaho (http://www.ag.uidaho.edu/pmc/). Additional

IPM recommendations, resources and website links are available at:

- USDA Western IPM Center (http://www.wripmc.org/).
- Pacific Northwest Weed Management Handbook (http://weeds.ippc.orst.edu/pnw/weeds).
- Pacific Northwest Insect Management Handbook (http://insects.ippc.orst.edu/pnw/insects).
- On-Line Guide to Plant Disease Control (http://insects.ippc.orst.edu/pnw/insects).

An appropriate set of mitigation techniques must be planned and implemented to reduce the environmental risks of pest management activities, in accordance with quality criteria in the Idaho FOTG. Mitigation techniques include practices such as Filter Strip or Conservation Crop Rotation, and management techniques like application method or timing.

Clients are responsible for following all label requirements for storage, handling and application of chemicals. Clients shall be instructed to pay special attention to all environmental hazards and site-specific application criteria listed on pesticide labels and contained in Extension and Crop Consultant recommendations.

All methods of pest management must be integrated with other components of the conservation plan to achieve the RMS level.

Additional Criteria to Protect Quantity and Quality of Commodities

As an essential component of both commodity-specific IPM and IPM general principles, clients shall be encouraged to use the minimum level of pest control necessary to meet their objectives for commodity quantity and quality.

Additional Criteria to Protect Soil Resources

In conjunction with other conservation practices, the number, sequence and timing of tillage operations shall be managed to maintain or improve soil quality, and maintain soil loss at or below the soil loss tolerance (T) or any other planned soil loss objective. Approved tools to evaluate soil erosion include the Revised Universal Soil Loss Equation (RUSLE2), the Wind Erosion Equation (WEQ) and soil quality rating procedures such as the Soil Conditioning Index (SCI) tool contained within RUSLE2.

Clients shall follow pesticide label instructions for limiting pesticide residues in soil that may negatively impact non-target plants, animals and humans.

Additional Criteria to Protect Water Resources

Pest management environmental risks, including the impacts of pesticides in ground and surface water on humans and non-target plants and animals, must be evaluated for all identified water resource concerns. The approved risk assessment tool, WIN-PST, evaluates the potential for off-site transport of pesticides and the associated hazards to humans and fish.

Appropriate mitigating practices to protect water resources shall be planned and applied as part of an RMS. Reference Table I "Idaho Mitigation Effectiveness Guide – Reducing Pesticide Impacts on Water Quality" and the Idaho FOTG, Section V "Conservation Practice Physical Effects" for impacts of planned practices on water resources. On irrigated lands, Irrigation Water Management (449) is required to minimize pest management environmental risk.

Clients shall follow pesticide label instructions for limiting pesticide residues in leachates and runoff that may negatively impact non-target plants, animals and humans.

Additional Criteria to Protect Air Resources

Clients shall follow pesticide label instructions for minimizing volatilization and drift that may negatively impact non-target plants, animals and humans.

Additional Criteria to Protect Plant Resources

Clients shall follow pesticide label instructions that address:

- Preventing misdirected pest management control measures that negatively impact plants (e.g., removing pesticide residues from sprayers before moving to the next crop and properly adjusting cultivator teeth and flame burners).
- Appropriate climatic conditions, crop stage, soil moisture, pH and organic matter in order to protect plant health.
- Limiting pesticide residues in soil that can carry over and harm subsequent crops.

Additional Criteria to Protect Animal Resources

Clients shall follow pesticide precautionary statements and instructions that minimize negative impacts to humans, domestic animals, wildlife and aquatic organisms.

Pursuant to Idaho state law governing pesticide application, any pesticide that is toxic to bees shall not be applied to any agricultural crop when such crop is in bloom or when bees are actively foraging on blooming weeds in the crop being sprayed except during evening/night/early morning hours. Refer to IDAPA 02.03.03.400 for exceptions at (http://adm.idaho.gov/adminrules/rules/idapa02/0303.pdf).

Additional Criteria to Protect Humans

Read and follow all pesticide label requirements, as well as local, State, Federal and tribal laws and regulations, regarding posting and field re-entry restrictions to treated areas. Handle and apply pesticides properly to protect the user and the environment from adverse impacts. Refer to Idaho NRCS Agronomy Technical Note 29, "Using Pesticides Safely."

CONSIDERATIONS

When commodity-specific IPM is unavailable, the following IPM principles should be considered.

- Encourage the use of IPM systems that utilize the most appropriate means of pest management including cultural, biological and chemical methods.
- Use field scouting, nematode assay and economic thresholds (where available) to determine if and when pesticides should be used in an IPM program. Treatment thresholds for specific pests and crops are available on the University of Idaho Pest Management Center website or at local County Extension offices. Avoid unnecessary and poorly timed pesticide applications.
- Consider site characteristics such as soil, geology, water filtration, depth to water table, proximity to surface water, topography and climatic conditions.
- Select pesticides which adequately protect crops and offer the least potential for surface and ground water contamination.
- Consider biocontrols which are adapted to related site conditions and characteristics.
- Follow currently recommended pesticide use programs which consider methods of avoiding pesticide resistance and shifts in the pest species spectrum.
- Soil reaction (pH), plant nutrients, soil moisture and soil condition should be managed to reduce plant stress, improve plant vigor and increase the plants overall ability to tolerate pests.
- Irrigation water should be managed to avoid conditions conducive to disease development and to minimize pest management environmental risks.
- Consider pest management strategies and low risk pesticides that protect beneficial plants, pollinators and insect populations. Pollinators and other beneficial insects are especially sensitive to broad spectrum insecticides and insecticidal dusts. Refer to Idaho NRCS Biology Technical Note 1 and to PNW Extension Publication 591 for more information.

PLANS AND SPECIFICATIONS

The pest management component of a conservation plan shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s).

As a minimum, the pest management component of a conservation plan shall include:

- Plan map and soil map of managed site, if applicable (use RMS plan maps if available).
- Location of sensitive resources and setbacks, if applicable (use RMS plan maps if available).
- Environmental risk analysis, with approved tools and/or procedures, for probable pest management recommendations by crop (if applicable) and pest.
- Interpretation of the environmental risk analysis and identification of appropriate mitigation techniques.
- Operation and maintenance requirements.

OPERATION AND MAINTENANCE

The owner/client is responsible for the proper implementation of this practice including operation and maintenance of all equipment. Operation and maintenance shall address the following:

- Plans shall be reviewed periodically to incorporate new IPM technology, respond to cropping system and pest complex changes and avoid development of pest resistance. Periodic review could be when a change occurs in the crop rotation or when new pesticides or bio-controls are labeled for use.
- Maintain mitigation practices and/or management techniques identified in the plan in order to ensure continued effectiveness.
- Develop a safety plan that includes telephone numbers and addresses for the nearest treatment centers for individuals exposed to chemicals, and the telephone number of the nearest poison control center. **The Regional Poison Center can be contacted 24 hours/day at 1-800-222-1222**. The National Pesticide Information Center (http://npic.orst.edu) may also be used in non-emergency cases by calling **1-800-853-7378**. For advice and assistance with emergency spills that involve agrichemicals, contact Idaho State Department of Agriculture **(208)-332-8500**. For large spills, contact CHEMTREC at **1-800-424-9300**.
- Locate all pesticide mixing areas and storage and supply areas (tanks) at least 150 feet away from any well or surface waterbody and downslope of wells.
- Prevent the contamination of water supplies by keeping the fillerhose or pipe out of the spray tank at all times. Install an anti-siphon device to prevent backflow. Never leave a spray tank unattended during filling.
- Pesticide used in chemigation shall be labeled for this method of application, shall be applied according to label specifications and all chemigation systems must be fitted with an anti-siphon device to prevent back flow. Pesticide chemigation must meet all requirements specified by Idaho pesticide and chemigation laws and rules.
- Store pesticides according to label directions and as specified by local, State and Federal regulations.
- Post warning signs around fields which have been treated and observe restricted entry intervals according to label directions and/or local, State and Federal law.
- Maintain appropriate Material Safety Data Sheets (MSDS).
- Calibrate equipment before mixing and loading pesticides. Calibrate equipment at the beginning of each season, periodically during the season and with each major pesticide change.
- Replace worn nozzle tips, cracked hoses and faulty gauges.
- Assure that the pesticide applicator knows the exact location of the area to be treated and the potential hazard of spray drift or

subsequent pesticide movement onto surrounding areas.

- Dispose of pesticide wastes and pesticide containers in accordance with label directions and local, State and Federal regulations. NRCS and the Idaho State Department of Agriculture strongly encourage recycling the empty pesticide and crop production containers through the Container Recycling Operation (CROP). For information on proper container recycling and the recycling program, contact the ISDA at (208) 465-332-8442 or go to its website at (http://www.agri.state.id.us/Categories/Pesticides/container/indexcontainermain.php).
- Maintain records of restricted use pesticide application for two years in accordance with US Department of Agriculture pesticide record keeping requirements and those of ISDA found at (http://www.agri.state.id.us/Categories/Pesticides/recordKeeping/indexUSDArecordkeepingMain.php).

REFERENCES

Biointensive Integrated Pest Management: Fundamentals of Sustainable Agriculture. ATTRA. http://attra.ncat.org/attra-pub/ipm.html

Biological Control: A Guide to Natural Enemies in North America. Cornell University. http://www.nysaes.cornell.edu/ent/biocontrol/index.html

How to Reduce Bee Poisoning from Pesticides. 2006. PNW Extension Publication PNW591.

Idaho Weed Resources. Idaho Department of Agriculture. http://www.uidaho.edu/weeds/

Idaho Department of Agriculture Rules Governing Pesticide and Chemigation Use and Application. http://adm.idaho.gov/adminrules/rules/idapa02/0303.pdf

Pesticide and Pesticide Container Handling and Disposal. 2006. Idaho NRCS Technical Note Agronomy 33.

Pollinators. 2007. Idaho NRCS Technical Note Biology 1.

PNW Conservation Tillage Handbook. STEEP. http://pnwsteep.wsu.edu/tillagehandbook/index.htm

PNW Insect Management Handbook. http://insects.ippc.orst.edu/pnw/insects.

PNW Weed Management Handbook. http://weeds.ipc.orst.edu/pnw/weeds

University of Idaho Pest Management Center. http://www.ag.uidaho.edu/pmc

Using Pesticides Safely. 2006. Idaho NRCS Technical Note Agronomy 29.

The Xerces Society for Invertebrate Conservation. http://www.xerces.org/

TABLE I – Idaho Mitigation Effectiveness Guide - Reducing Pesticide Impacts on Water Quality

Note: Pest Management (595) requires environmental risk evaluation and appropriate mitigation for all identified resource concerns. This table identifies management techniques and conservation practices that have the potential to mitigate pesticide impacts on water quality. Not all techniques will be applicable to a given situation. Relative effectiveness ratings by pesticide loss pathway are "no effect" (blank), "slight effect" (+/-), "moderate effect" (++/--), and "significant effect" (+++/---). The table also identifies how the techniques function. Effectiveness of any mitigation technique can be highly variable based on site conditions and how it is designed. Therefore, with guidance provided by the table, site-specific selection and design of mitigation techniques that are appropriate for identified resource concerns are left to the professional judgment of the conservation planner.

Pest Management Mitigation Techniques	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Management Techniques [1/]				
Application Timing	+++	+++	+++	Reduces exposure potential - delaying application when significant rainfall events are forecast can reduce pesticide transport to ground and surface water, application when conditions are optimal can reduce the amount of pesticide applied, also delaying application when wind speed is not in accordance with label requirements can reduce pesticide drift to surface water
Formulations/Adjuvants	++	++	+	Reduces exposure potential – formulations and/or adjuvants that increase efficacy allow lower application rates
Lower Application Rates	+++	+++	+++	Reduces exposure potential - use lowest effective rate
Partial Treatment	+++	+++	+++	Reduces exposure potential - spot treatment, banding and directed spraying reduce amount of pesticide applied
Pesticide Label Environmental Hazard Warnings and BMPs	Required [2/]	Required [2/]	Required [2/]	Reduces exposure potential - label guidance must be carefully followed for pesticide applications near water bodies and on soils that are intrinsically vulnerable to erosion, runoff or leaching
Scouting and Integrated Pest Management (IPM)Thresholds	+++	+++	+++	Reduces exposure potential - reduces the amount of pesticide applied

TABLE I - (continued)

Pest Management Mitigation Techniques	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Set-backs	+	++	+	Reduces exposure potential - reduced application area reduces amount of pesticide applied, can also reduce inadvertent pesticide application and drift to surface water
Soil Incorporation – mechanical or irrigation	---	+++	+++	Reduces exposure potential for surface losses, but increases exposure potential for leaching losses
Substitution – ▪ Alternative pesticides ▪ Cultural controls ▪ Biological controls	+++	+++	+++	Reduces hazard potential - use alternative pesticides with low environmental risk, substituting cultural (including burning and mechanical controls) and biological controls can reduce the need for pesticides
Conservation Practices [3/]				
Agrichemical Mixing Center (Interim - 702)	+++	+++	+++	Reduces the potential for point source pesticide contamination
Alley Cropping (311)	+	+	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, can provide habitat for beneficial insects which can reduce the need for pesticides, can reduce pesticide drift to surface water
Anionic Polyacrylamide (PAM) Erosion Control (450)	-	+	+++	Increases infiltration and deep percolation, reduces soil erosion
Bedding (310)	+	+	+	Increases surface infiltration and aerobic pesticide degradation in the rootzone
Brush Management (314)	+++	+++	+++	Using non-chemical brush control often reduces the need for pesticides, pesticide use requires environmental risk analysis and appropriate mitigation
Conservation Cover (327)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter

TABLE I - (continued)

Pest Management Mitigation Techniques	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Conservation Crop Rotation (328)	++	++	++	Reduces the need for pesticides by breaking pest lifecycles
Constructed Wetland (656)	+	+	++	Captures pesticide residues and facilitates their degradation
Contour Buffer Strips (332)		++	++	Increases infiltration, reduces soil erosion
Contour Farming (330)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion
Contour Orchard and Other Fruit Area (331)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion
Cover Crop (340)	+	+	++	Increases infiltration, reduces soil erosion, builds soil organic matter
Cross Wind Ridges (589A)			(+) 4/	Reduces wind erosion and adsorbed pesticide deposition in surface water
Cross Wind Trap Strips (589C)			(++) 4/	Reduces wind erosion and adsorbed pesticide deposition in surface water, traps adsorbed pesticides
Deep Tillage (324)	-	+	+	Increases infiltration and deep percolation
Dike (356)	++/--	++	++	Reduces exposure potential - excludes outside water (++ leaching) or captures pesticide residues and facilitates their degradation (-- leaching)
Diversion (362)	+	+	+	Reduces exposure potential - water is diverted
Drainage Water Management (554)	++/--	++	++	Seasonal saturation may reduce the need for pesticides, drainage reduces storm water runoff, drainage increases infiltration and aerobic pesticide degradation in the rootzone during the growing season (++ leaching), seasonal saturation may bring the water table in contact with pesticide residues from the previous growing season (-- leaching)

TABLE I - (continued)

Pest Management Mitigation Technique	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Field Border (386)		+	++	Increases infiltration and traps adsorbed pesticides, often reduces application area resulting in less pesticide applied, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, can reduce inadvertent pesticide application and drift to surface water
Filter Strip (393)		++	+++	Increases infiltration and traps adsorbed pesticides, often reduces application area resulting in less pesticide applied, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, can reduce inadvertent pesticide application and drift to surface water
Forage Harvest Management (511)	++	++	++	Reduces exposure potential - timely harvesting reduces the need for pesticides
Forest Stand Improvement (666)	++	++	++	Reduces the potential for pest damage and need for pesticides
Grade Stabilization Structure (410)			++	Traps adsorbed pesticides
Grassed Waterway (412)		+	++	Increases infiltration and traps adsorbed pesticides (should be applied with Filter Strips at the outlet and on each side of the waterway)
Grazing Land Mechanical Treatment (548)	-	+	+	Increases infiltration and deep percolation
Hedgerow Planting (422)			(+) 4/	Reduces adsorbed pesticide deposition in surface water, can reduce inadvertent pesticide application and drift to surface water

TABLE I - (continued)

Pest Management Mitigation Technique	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Herbaceous Wind Barriers (603)			(+) [4/]	Reduces wind erosion, traps adsorbed pesticides, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, can reduce pesticide drift to surface water
Hillside Ditch (423)	+	+	+	Reduces exposure potential - water is diverted
Irrigation Land Leveling (464)	++	+	++	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Irrigation System, Microirrigation (441)	++	+++	+++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Sprinkler (442)	++	++	++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Surface and Subsurface (443)	+	+	+	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Tailwater Recovery (447)		+++	+++	Captures pesticide residues and facilitates their degradation
Irrigation Water Management (449)	+++	+++	+++	Reduces exposure potential - water is applied at rates that minimize pesticide transport to ground and surface water, promotes healthy plants which can better tolerate pests
Land Smoothing (466)	+	+	+	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Mole Drain (482)	+	+	+	Increases infiltration and aerobic pesticide degradation in the rootzone *Note – avoid direct outlets to surface water

TABLE I - (continued)

Pest Management Mitigation Technique	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Mulching (484)	+	+/-	+/-	Often reduces the need for pesticides, natural mulches increase infiltration and reduce soil erosion (+ solution and adsorbed runoff), artificial mulches may increase runoff and erosion (- solution and adsorbed runoff)
Nutrient Management (590)	++	++	++	Promotes healthy plants which can better tolerate pests
Pasture and Hay Planting (512)	++	++	++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter
Precision Land Forming (462)	++	+	++	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Prescribed Burning (338)	++	++	++	Often reduces need for pesticides
Prescribed Grazing (528)	++	++	++	Improves plant health and reduces the need for pesticides
Range Planting (550)	++	++	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, builds soil organic matter
Recreation Area Improvement (562)	++	++	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, builds soil organic matter
Residue Management, No Till/Strip Till/Direct Seed (329)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management, Mulch Till (345)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management, Ridge Till (346)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management, Seasonal (344)	+	+	+	Increases infiltration, reduces soil erosion, builds soil organic matter
Riparian Forest Buffer (391)	+	+++	+++	Increases infiltration and uptake of subsurface water, traps sediment, builds soil organic matter
Riparian Herbaceous Cover (390)	+	++	++	Increases infiltration, traps sediment, builds soil organic matter

Row Arrangement (557)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion

TABLE I - (continued)

Mitigation Technique	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Sediment Basin (350)			++	Captures pesticide residues and facilitates their degradation
Stripcropping (585)		+	+	Increases infiltration, reduces soil erosion
Structure for Water Control (587)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Subsurface Drain (606)	+	++	++	Increases infiltration and aerobic pesticide degradation in the rootzone *Note – avoid direct outlets to surface water
Surface Drainage, Field Ditch (607)	+	+	+	Increases infiltration and aerobic pesticide degradation in the rootzone
Surface Roughening (609)			(+) 4/	Reduces wind erosion and adsorbed pesticide deposition in surface water
Terrace (600)	--	++	+++	Increases infiltration and deep percolation, reduces soil erosion
Tree/Shrub Establishment (612)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, increases infiltration and uptake of subsurface water, builds soil organic matter
Waste Storage Facility (313)	+	++	++	Captures pesticide residues
Waste Treatment Lagoon (359)		+++	+++	Captures pesticide residues and facilitates their degradation
Waste Utilization (633)	++	++	++	Increases soil organic matter
Water and Sediment Control Basin (638)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Waterspreading (640)	-	+	+	Increases infiltration and deep percolation
Well Decommissioning (351)	+++			Eliminates point source contamination
Wetland Creation (658)	+	+	+	Captures pesticide residues and facilitates their degradation
Wetland Enhancement (659)	+	+	+	Captures pesticide residues and facilitates their degradation

Wetland Restoration (657)	+	+	+	Captures pesticide residues and facilitates their degradation
Windbreak/Shelterbelt Establishment (380)			(++) [4/]	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, can reduce pesticide drift
Windbreak/Shelterbelt Renovation (650)			(++) [4/]	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, can reduce pesticide drift

[1/] Additional information on pest management mitigation techniques can be obtained from Extension pest management publications, pest management consultants and pesticide labels.

[2/] The pesticide label is the law - all pesticide label specifications must be carefully followed including required mitigation. Additional mitigation may be needed to meet NRCS pest management requirements for identified resource concerns.

[3/] Details regarding the effects of Conservation Practices on ground and surface water contamination by pesticides are contained in the Conservation Practice Physical Effects (CPPE) matrix found in the National Handbook of Conservation Practices (NHCP).

[4/] Mitigation applies to adsorbed pesticide losses being carried to surface water by wind.

TABLE I Mitigation Effectiveness Guide - Reducing Pesticide Impacts on Water Quality is based on available research specific to the technique, related research and the NWCC Pest Management Team's best professional judgment. The ratings are relative index values as opposed to absolute values, much like the Conservation Practice Physical Effects (CPPE) matrix. They are intended to help planners choose the best combination of techniques for their identified resource concerns. The ratings are based on the relative *potential* for a technique to provide mitigation. The technique has to be specifically designed, implemented and maintained for the mitigation potential to be realized. Varying site conditions can result in a great deal of variation in actual mitigation effectiveness, but our relative index values indicate which techniques will generally provide more or less mitigation under a given set of conditions. Our general rule of thumb is that single pluses (+'s) generally have the potential to reduces losses by 10 -15%, ++'s have the potential to reduces losses by about 25% and +++'s have the potential to reduce losses by about 50%.

The original matrix was developed by the Environmental Protection Agency (EPA)-sanctioned Aquatic Dialogue Group and published by the Society of Environmental Toxicology and Chemistry (SETAC). The original reference is: *Aquatic Dialogue Group: Pesticide Risk Assessment and Mitigation, Baker JL, Barefoot AC, Beasley LE, Burns LA, Caulkins PP, Clark JE, Feulner RL, Giesy JP, Graney RL, Griggs RH, Jacoby HM, Laskowski DA, Maciorowski AF, Mihaich EM, Nelson Jr HP, Parrish PR, Siefert RE, Solomon KR, van der Schalie WH, editors. 1994. Society of Environmental Toxicology and Chemistry, Pensacola, FL., pages 99-111 and Table 4-2.* They provided ranges of effectiveness for various mitigation techniques. With their permission, we expanded their work for the National Employee Development Center's (NEDC) *Nutrient and Pest Management Considerations in Conservation Planning* course materials. Richard Aycock from Louisiana was the first to put a mitigation matrix into an NRCS Pest Management (595) standard, based in large part on Table 6.2 (pages 67 - 68), and Table, 6.4 (pages 71 - 72) in *Module 6, Part C-Integrating Nutrient and Pest Management with Other Conservation Practices* in our *Nutrient and Pest Management Considerations in Conservation Planning* course materials. Table 1

was built from the Louisiana matrix by adding additional management techniques and conservation practices.